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Comment

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Editorial introduction

In October 2011, CFGnet (Cities as Forces for Good Network) published a Sustainability Concepts Paper: "Cities as Forces for Good in the Environment: Sustainability in the Water Sector" (Beck, 2011). Authored by chemical and environmental engineer M Bruce Beck[1], this grand oeuvre addresses the Big Questions of how one might approach the re-engineering of city infrastructures, subject to the "Triple Bottom Line" of environmental benignity, economic feasibility and social legitimacy. Michael Thompson comments.

Keywords: Sustainability, cultural theory, clumsy solution, engineering, plurar rationality.

Civil engineering, back in the confident day of Brunel, Telford *et al*., was defined as "the harnessing of the great forces in nature for the benefit of mankind"[2]. Civil engineers therefore needed science (so as to understand those great forces) and engineering skill and judgement (so as to do the harnessing). The benefits for mankind, by contrast, did not give much pause; they were obvious and generally agreed. And when there were some dissenters–Wordsworth, the Pre-Raphaelites, Ruskin, ... The Duke of Wellington even–they could easily be ignored. The Duke of Wellington, for instance, was against the railways, on the grounds that they would "just encourage the lower orders to travel needlessly about" (*hypermobility*, as it is now called), but he was powerless to stop them, despite being prime minister at the time! So the knotty question of what constitutes a benefit to mankind did not receive the attention it should have. Rectifying that, you could say, is what Bruce Beck's *concepts paper* is all about. (I have chosen British examples, not just because I am British, but because Britain is where the Industrial Revolution happened; Britain, you could say, is where the engineering mould that Beck is intent on breaking got set.)

In his concepts paper, Beck takes issue with the current orthodoxy that insists that there will be no progress without an operational definition of sustainability. Such a definition, he argues, since it would embody just one "social construction" of the man/nature relationship, just one style of engineering, would lead to "elegant" solutions, whilst what is needed is pretty much the opposite: "clumsy" solutions that emerge from the constructive engagement of all the social constructions, all the styles of engineering. This is easily said, but spelling out its import

1 M Bruce Beck is Professor and Eminent Scholar in the Warnell School of Forestry and Natural Resources at the University of Georgia, where he holds the Wheatley-Georgia Research Alliance Endowed Chair in Water Quality and Environmental Systems. He is also a Visiting Professor in the Department of Civil and Environmental Engineering at Imperial College London.

2 This definition was drummed into me by my father and so would have been current around the time, in the 1920s, when he qualified as a civil engineer.

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for engineering (as is evident from this *concepts paper's* length and complexity) is far from straightforward.

Sustainability is problematical, not because there are all sorts of villains and ignoramuses out there who are bent on unsustainability, but because people–virtuous and thoughtful people–have different and mutually irreconcilable ideas of just what is sustainable and what is not. The members of the Voluntary Extinction Movement, for instance, see pretty well all human activity as unsustainable; hence their solution for ensuring that there are fewer and fewer of us. Others see little to worry about, reassuring one another that "If something is unsustainable it will stop". Yet others–those who speak of "safe limits", "tolerable risks", "dangerous climate change", "assimilative capacities" and so on–discern a boundary line between those interventions that Mother Nature can cope with and those that, if permitted, would result in her systemic collapse. Sorting out these conflicting *myths of nature*, along with the contending patterns of social relationships (*solidarities*) that are variously upheld or undermined by those myths, has been the stock-in-trade of those (myself among them) who, over the past 30 or so years, have developed the cultural theory (or theory of plural rationality) that Bruce Beck has now dragged into engineering, in the hope of doing something about his profession's failure to get to grips with the increasingly vexed question "What is a benefit?".

In fact, engineers have been among the most enthusiastic takers-up of the ideas of the late Mary Douglas (e.g. 1975), the eminent British anthropologist who pioneered this cultural theory/plural rationality approach (e.g. Dixit, 2002; Gyawali, 2003; Hofstetter, 1998). These engineers, when laid into by social scientists who are not themselves cultural theorists, reply mildly that they find that this theory helps them sort out problems (such as the conflicts and impasses that arise between China, Nepal, India and Bangladesh in connection with what is euphemistically called "the cooperative development of Himalayan water resources") (Dixit, 1997) whilst others that they have tried–the realist framework in international relations, for instance, and rational choice theory–have proved seriously inadequate (Thompson & Gyawali, 2001). However, if their critics can come up with some other social theory that will do the job just as well (or better) then they will be happy to switch across to it. This is the spirit in which Beck has brought cultural theory/plural rationality into his extraordinarily ambitious synthesis.

- Instead of the straightforward and familiar sequence–options identification, options assessment, and then the selection of the best, followed by its optimisation–we get a discursive and argumentative process–a "constructive engagement" between the proponents of a number of contradictory certainties–that will lead, often but not always, to the emergence of a clumsy solution.

- The counter-intuitive feature of a clumsy solution–it derives from the high *deliberative quality* that results from each of the "voices" being able (a) to make itself heard and (b) then being responsive to the others–is that each set of contending actors ends up getting more of what it wants (and less of what it does not want) than it would have done if it had managed to impose its elegant solution by excluding the others. (A civil engineering example–Arsenal Football Club's new stadium–is set out in chapter 1 of Thompson, 2008)[3].

All that is needed, to my simple anthropological mind, is an institutional set-up that, by ensuring *accessibility* and *responsiveness*, creates the conditions for the emergence of clumsy solutions. Then, provided each set of actors is supported and advised by its stylistically appropriate engineers (as, for instance, was the case with the triangular resolution–between Shell, the British government and Greenpeace–to the disposal of the Brent Spar oil storage structure [see Thompson, 2003]) that's it! Why, then, is Beck's *concepts paper* so long and so replete with triple bottom lines, mathematical notations, virtual realities and so on? The answer, I think, comes in two parts.

- It would be rash to assume that, once all the solidarities enjoy access and responsiveness, the appropriate engineers will be there to support and guide them. As with architecture under the tyranny of the Modern Movement (Thompson, 2005), when if you didn't bend the knee to Le Corbusier you couldn't become an architect, one or more of the required kinds of engineer may have been marginalized or even completely excluded from the profession.

- And, if engineering is not automatically the broad church that it needs to be, then it will have to ensure that the requisite variety of engineering styles is constitutionally ensured; it can no longer be left to chance. Beck's paper can thus be seen as a first draft of that constitution.

3 Arsenal Football Club (the individualist actor) initially approached Islington Borough Council (the hierarchical actor) with the idea of gaining approval for the club to expand on its then-existing Highbury Stadium site by demolishing some of the streets of houses around it. In less than 24 hours of this approach becoming public knowledge, an egalitarian actor–the Highbury Community Association–emerged, and it soon became clear (despite Arsenal's threat that it would be forced to move out of the borough) that the initial proposal was dead. In response to this crisis, two commercial property surveyors, who also happened to be loyal Arsenal supporters, scrutinised their maps and discovered there was a triangular piece of land, bounded on two sides by railway lines and owned by Islington Council (who had it rented out on short leases to various businesses that could quite easily be relocated nearby) that would comfortably take a stadium of the size and quality Arsenal was intent on. This site–just a kilometre from the old ground–is where Arsenal's new Emirates Stadium now stands, yet it had gone entirely unnoticed until the debate was fully pluralised by the entry of the third actor.
Arsenal has got its new home (and a good price for its old one), Islington has kept the club in the borough (and extracted an impressive "planning gain"), the Highbury Community Association has saved the homes (and secured the equitable relocation of the businesses and associated jobs) and the club's "cannon fodder" supporters are still able to find their way on foot (via their favourite pubs and chip shops) to the matches. A win-win-win-win outcome!

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